AMENDMENTS TO THE CLAIMS

1. (Canceled)

2. (Previously Presented) The microfluidic device of claim 7, wherein the surface carrying the coat is made of organic material.

3. (Previously Presented) The microfluidic device of claim 7, wherein the surface of the planar substrate is made of plastics.

4. (Previously Presented) The microfluidic device of claim 7, wherein the non-ionic hydrophilic polymer is attached covalently directly to the surface or to a polymer skeleton that is attached to the surface.

5. (Previously Presented) The microfluidic device of claim 7, wherein the microfluidic device comprises more than five covered microchannel structures.

6. (Canceled)

7. (Currently amended) A microfluidic device being in a dry state that is capable of being rehydrated, said device comprises a set of one or more covered microchannel structures manufactured in the surface of a planar substrate, wherein each microchannel structures comprises:

   a) more than one functional part wherein at least one of ~~which~~ said functional parts is selected from the group consisting of a volume defining unit, a mixing cavity, and a waste cavity;

   b) wherein reduced non-specific adsorption and hydrophilicity have been optimized by a coating exposing a non-ionic hydrophilic polymer on the surface of at least one of said at least one functional parts such that an aqueous liquid is capable of entering the functional part by self-suction when the liquid has passed the entrance of the functional part; and

c) wherein the device is adapted for mass transport of solutes and/or particles between different functional parts of each microchannel structure by a liquid flow caused by non-electrokinetic forces.

8. (Previously Presented) The microfluidic device of claim 7, wherein each microchannel structure comprises a microcavity having a volume ÿ 1 ÿl.

9. (Canceled)

10. (Previously Presented) The microfluidic device of claim 7, wherein the device is a round disc.

11. (Previously Presented) The microfluidic device of claim 7, wherein the non-ionic hydrophilic polymer contains hydroxy groups, ethylene oxy groups, or amide groups.

12. (Previously Presented) The microfluidic device of claim 11, wherein the non-ionic hydrophilic polymer is a polyhydroxy polymer.

13. (Previously Presented) The microfluidic device of claim 7, wherein the non-ionic hydrophilic polymer is selected from the group consisting of polysaccharides, water-soluble derivatives of polysaccharides, polyvinyl alcohols, and poly(hydroxy alkyl vinylether) polymers.

14. (Previously Presented) The microfluidic device of claim 7, wherein the non-ionic hydrophilic polymer is a reaction product between ethylene oxide and a dihydroxy or a polyhydroxy compound.

15. (Previously Presented) The microfluidic device of claim 11, wherein the non-ionic hydrophilic polymer comprises one or more blocks of polyoxyethylene chains.

16. (Previously Presented) The microfluidic device of claim 15, wherein the non-ionic hydrophilic polymer is polyethylene glycol.

17. (Previously Presented) The microfluidic device of claim 11, wherein the non-ionic hydrophilic polymer is polyethylene glycol which has a methoxy group at the end which does not bind to the part surface.

18. (Previously Presented) The microfluidic device of claim 11, wherein the non-ionic hydrophilic polymer comprises a plurality of amide groups.

19. (Previously Presented) The microfluidic device of claim 7, wherein the non-ionic hydrophilic polymer a polymerisate/copolymerisate with monomers selected from the group consisting of acrylamide, methacrylamide and vinylpyrrolidone.

20. (Previously Presented) The microfluidic device of claim 7, wherein the non-ionic hydrophilic polymer is attached to a polymer skeleton that is attached to the part surface.

21. (Previously Presented) The microfluidic device of claim 20 wherein the attachment between the non-ionic hydrophilic polymer and the polymer skeleton is covalent.

22. (Previously Presented) The microfluidic device of claim 20, wherein the polymer skeleton is an organic polymer.

23. (Previously Presented) The microfluidic device of claim 20, wherein the skeleton is selected from the group consisting of cationic, anionic, and neutral polymers.

24. (Previously Presented) The microfluidic device of claim 20, wherein the skeleton is a polyamine.

25. (Previously Presented) The microfluidic device of claim 20, wherein the skeleton is a polyethylene imine.

26. (Previously Presented) The microfluidic device of claim 20, wherein the skeleton has a molecular weight 10,000-3,000,000 dalton.

27. (Previously Presented) The microfluidic device of claim 7, wherein the surface of the planar substrate without the coat is made of plastics and the part surface without coat is hydrophilized by plasma treatment or by an oxidation agent in order to introduce functional groups that allow for a subsequent attachment of the coat onto the part surface.

28. (Previously Presented) The microfluidic device of claim 7, wherein the surface of the planar substrate is made of plastics and that the plastics has a non-significant fluorescence for excitation wavelengths in the interval 200-800 nm and emission wavelengths in the interval 400-900 nm.

29. (Canceled)

30. (Previously Presented) A method of performing an analytical assay in a microchannel structure of the microfluidic device of claim 7 comprising the steps of:

(a) preparing a sample;

(b) transporting an analyte and reagents between different function parts of the microchannel structure by a liquid flow caused by non-electrokinetic forces and running the assay reaction within the device; and

(c) detecting within the device the result of the assay reaction, wherein the result is a measure of an activity and/or a quantitative presence of an analyte in the sample.

Claims 31-33 are Canceled.

34. (Previously Presented) The microfluidic device of claim 3, wherein the plastics is based on a polymer of aliphatic monomers containing polymerizable carbon-carbon double bonds.

35. (Previously Presented) The microfluidic device of claim 34, wherein the monomer is selected from the group consisting of a cycloalkene, ethylene and propylene.

Claims 36-41 are Canceled.

42. (Previously Presented) The microfluidic device of claim 7, wherein the surface carrying the coat is made of inorganic material.

43. (Previously Presented) The microfluidic device of claim 20, wherein the polymer skeleton is an inorganic polymer.

44. (Canceled)

45. (Previously Presented) The microfluidic device of claim 35, wherein the cycloalkene is norbornene or substituted norbornene.

Claims 46-53 (Cancelled)

54. (Previously Presented) The microfluidic device of claim 7 further comprising functional parts of a detection cavity or a chamber for chromatography or a reaction microcavity.